UT Bear Creek (Phillips) Stream Restoration Site

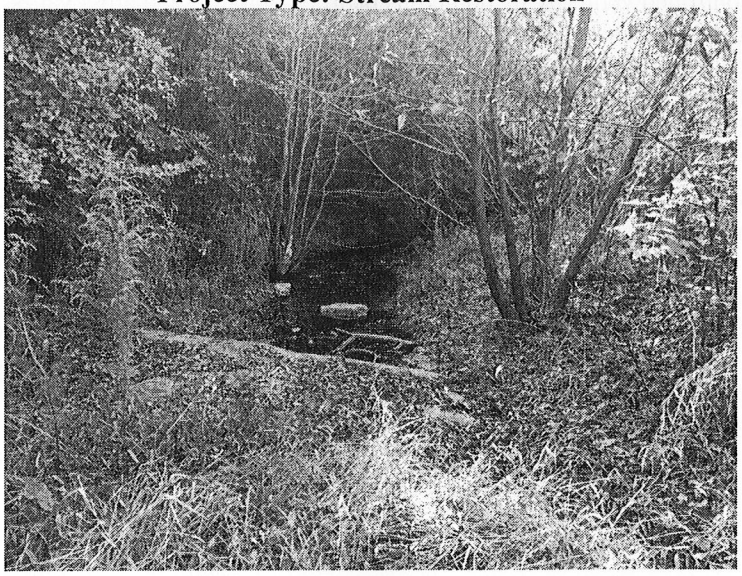
EEP Project #92719
USACE Action ID # 200321137
DWQ 401 # 030909

7-9-2014

1210

Closeout Report

Project Type: Stream Restoration



Privet Mimosa Ongoing control

EEP. Privet Treatment late growing season 2014

Submitted: January 2014

Project Setting and Classifications	
UT Bear Creek (Phillips) Stream Restoration Site	
County	Chatham
General Location	Pittsboro
Basin	Cape Fear
Physiographic Region	Piedmont
Ecoregion	Carolina Slate Belt
USGS Hydro Unit	03030003070050
NCDWQ Sub-basin	03-06-12
Thermal Regime	warm
Trout Water	No
Project Performers	
Source Agency	NCDOT
Provider	NCEEP
Designer	Environmental Services, Inc.
Monitoring Firm	KCI Associates of NC
Planting	Unknown
Supplemental Planting	Carolina Silvics, Inc.
Invasive Species Mgmt	Carolina Silvics, Inc.
Property Interest Holder	NC DOT

Project Activities and Timeline	
Milestone	Month-Year
Concept Plan	April 2002
Project Instituted	January 2003
Restoration Plan	June 2003
Construction	March 2006
As-Built Survey	March 2006 - Dec 2006
Year 1 Monitoring	December 2009
Year 2 Monitoring	Dec ecember2010
Year 3 Monitoring	December 2011
Year 4 Monitoring	November 2012
Year 5 Monitoring	November 2013
Beaver dam removal	2013- 2014
Supplemental Planting	November 2013
Invasive species treatment	Jan. & May 2014

Dec 2006

PROJECT SETTING AND BACKGROUND SUMMARY

In 2002, the North Carolina Department of Transportation identified the Unnamed Tributary (UT) to Bear Creek Site (Phillips) in Chatham County, North Carolina as a potential stream restoration project. The project restored approximately 2,378 linear feet of channel; 1,921 feet on UT Bear Creek and 457 feet on unnamed tributary 2 (UT2) and enhanced an additional 935 feet of channel on UT2. The NCDOT completed project construction in 2006. In August 2007, the project was transferred to the North Carolina Ecosystem Enhancement Program (EEP).

There are two hydrologic features on the site. The first, UT Bear Creek, has been restored by altering the dimension, pattern, and profile and is controlled vertically by numerous bedrock outcrops and cross vanes. The second feature, UT 2, consists of two reaches; UT 2A was enhanced, and UT 2B was restored. UT 2A had banks stabilized by the mature trees that line both sides of the channel for the length of the reach. This reach was enhanced by planting native vegetation in the riparian buffer beyond the top of bank and excluding cattle from the buffer. UT 2B begins where UT 2A ends at the ford crossing at Station 39+75. This reach was restored by changing the dimension, pattern, and profile of the channel from the ford to the confluence with UT Bear Creek. Prior to restoration, the project streams had been impacted by livestock. The entire 11.9 acre easement has been fenced to exclude cattle and four dedicated ford crossings, located outside the easement, were stabilized to allow for passage between pastures.

Supplemental planting occurred in November 2013 on portions of the site to address areas of poor vigor or low density. A total of 204 containerized plants were installed in areas indicted in the Remediation Map included in this report. Invasive species treatment was conducted in January of 2014 and is scheduled to occur in May 2014 and again in the fall of 2014. Beaver dams offsite had impacted the lower reach of Ut to Bear Creek, the dam has since been breached and the beaver removed. The site is stable and well vegetated.

PROJECT GOALS AND OBJECTIVES

The goals and objectives of the restoration project are as follows:

Project Goals:

- Improve water quality.
- Improve riparian and in-stream habitat

Project Objectives:

- Excluding cattle from the stream channels.
- Increasing channel stability.
- Restoring dimension, pattern, and profile to UT Bear Creek and UT 2.

SUCCESS CRITERIA

The permit conditions required Level I, vegetative and visual monitoring. No stream channel morphology monitoring was required.

UT Bear Creek (Phillips) Stream Restoration Site Success Criteria

Feature	Success Criteria	Success Criteria Met
Vegetation	Average of 260 stems/acre, as indicated by permanent vegetation plots after 5 years of monitoring.	Yes

Ut to Bear Creek (Phillips) – 92719 Asset Table

Restoration Segment/Reach	Pre – Construction (acreage/linear feet)	Mitigation Approach	Watershed Acreage	As-Built Linear Footage/Acreage	Project Linear Feet	Mitigation Ratio	Mitigation Units (SMU/WMU)
STREAM							
Ut Bear Creek	**1926**	**R**	**1,088**	**10+00 -29+77**	**1977**	1:1	**1,942***
UTA	**975**	**EII**		**30+00- 39+75**	**975**	2.5:1	**376****
UT2B	**403*****	**R**	**96**	**39+75 – 44+32**	**457**	1:1	**457**
Total							**2,775**

*Two ford crossings (16 ft. & 20 ft.) located on main stem removed from assets
** Two ford crossings (16 ft. & 20 ft.) located on tributary removed from assets
*** Estimated by GIS

Mitigation Units Totals

Stream Mitigation Units (SMUs)	Riparian Wetland Units	Non-Riparian Units	Total Wetland Units	Riparian Buffer	Nutrient Offset
2,775	0	0	0	0	0

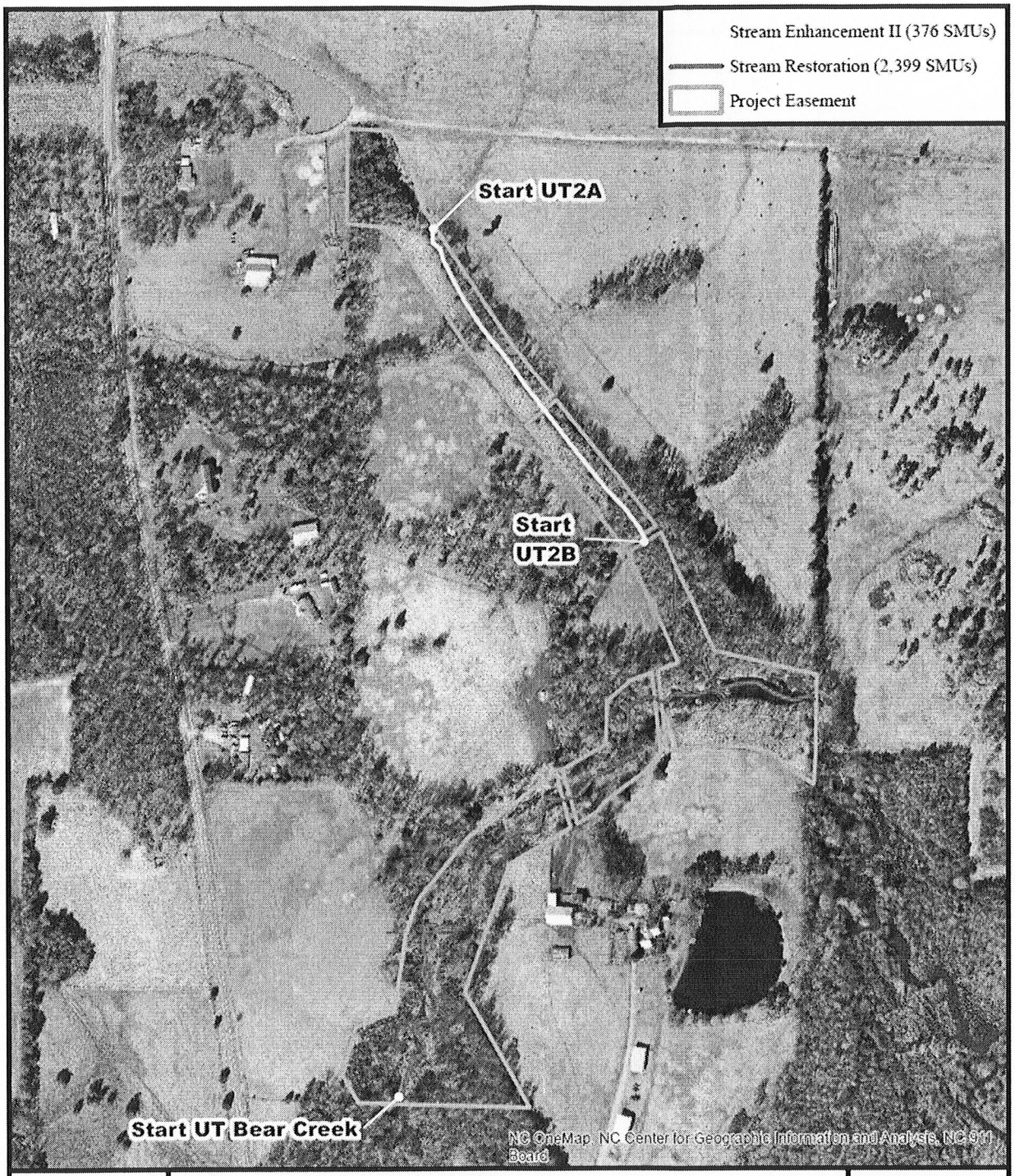


Figure 4. Project Asset Map
UT Bear Creek, Chatham County, EEP Project # 92719

350 175 0 350
Feet

Image Source: Eastern Piedmont Orthoimagery, 2013.

Ecosystem Enhancement

KCI ASSOCIATES OF NC

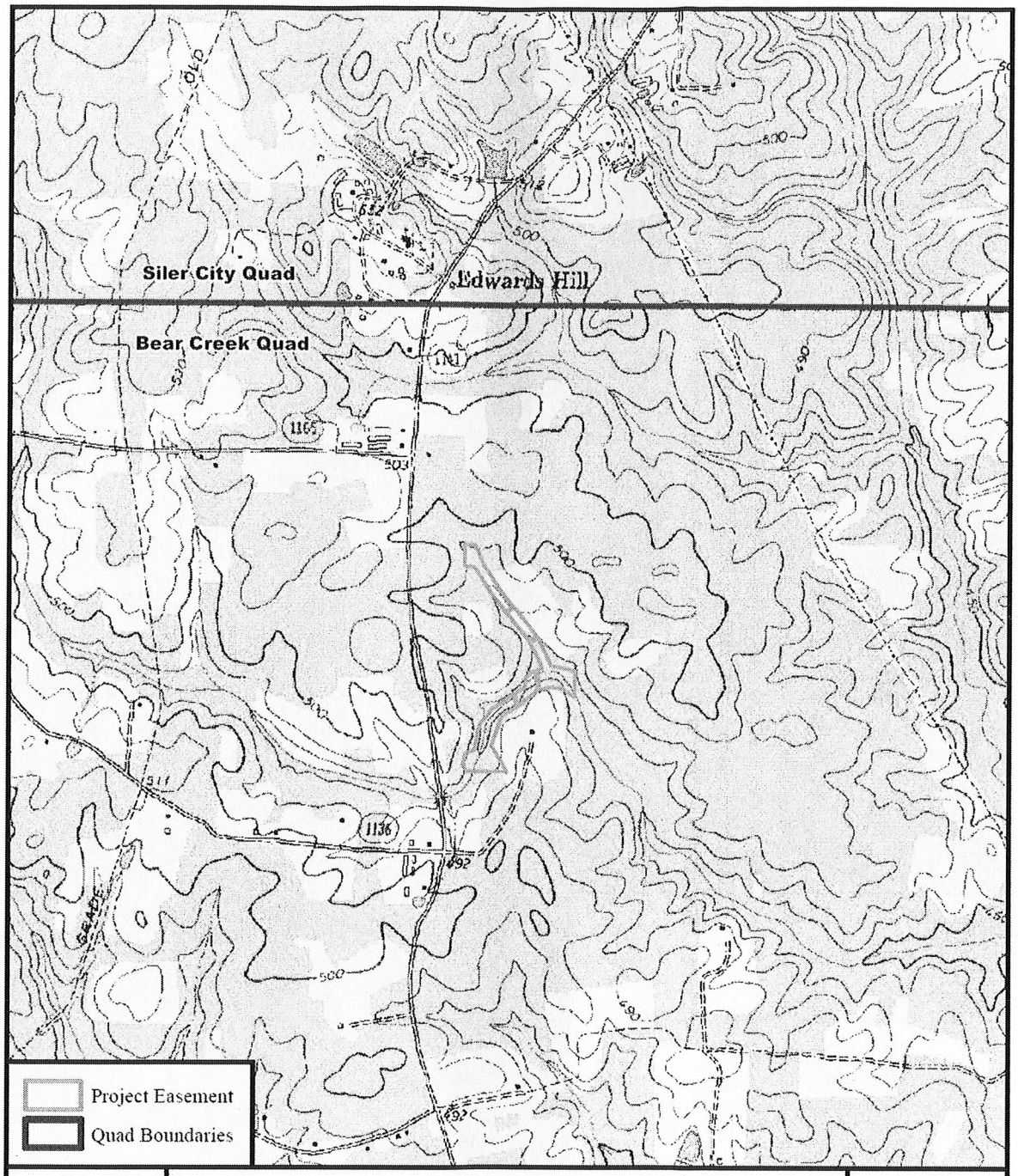


Figure 2. USGS Topographic Map
UT Bear Creek, Chatham County, EEP Project # 92719

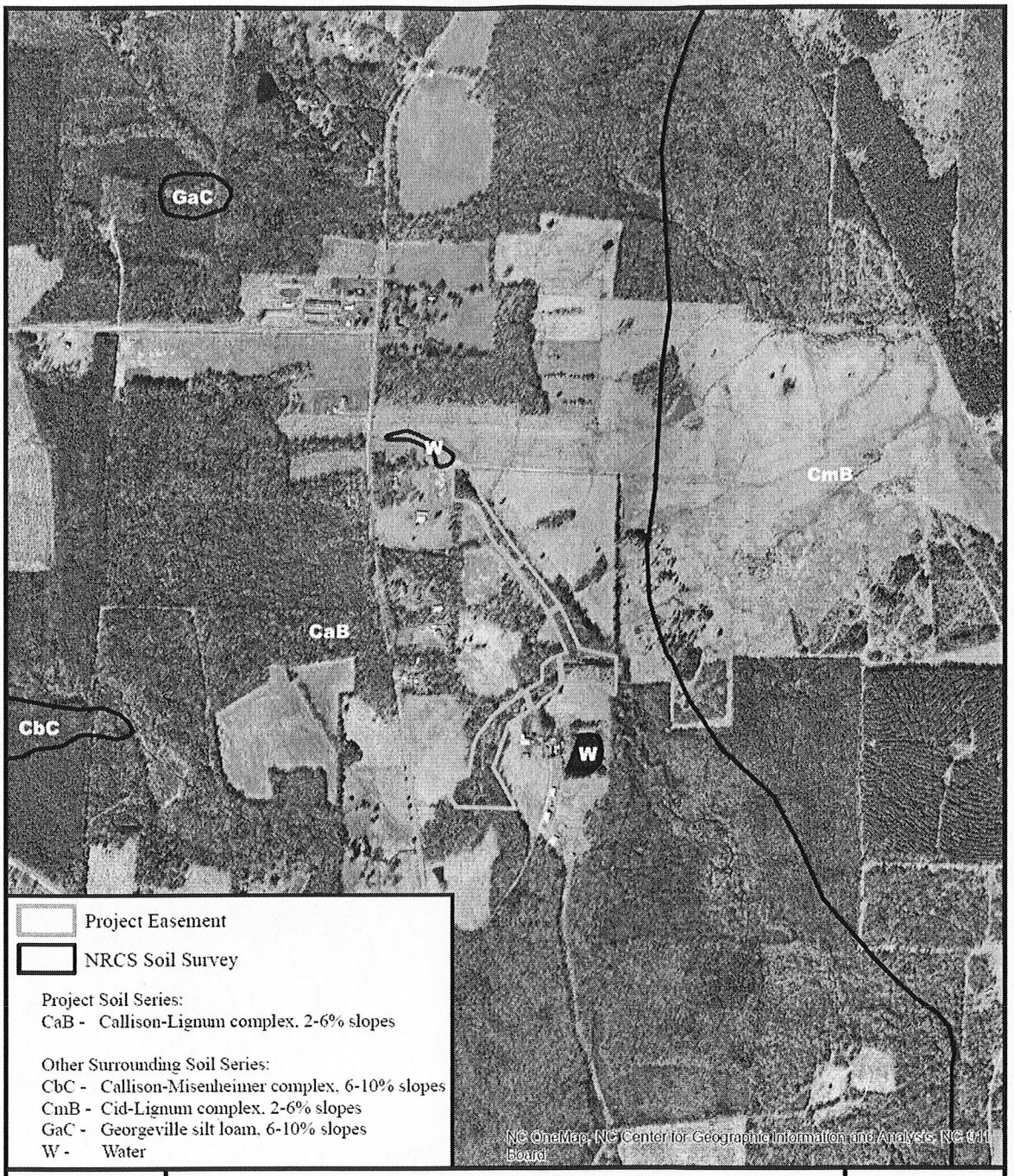


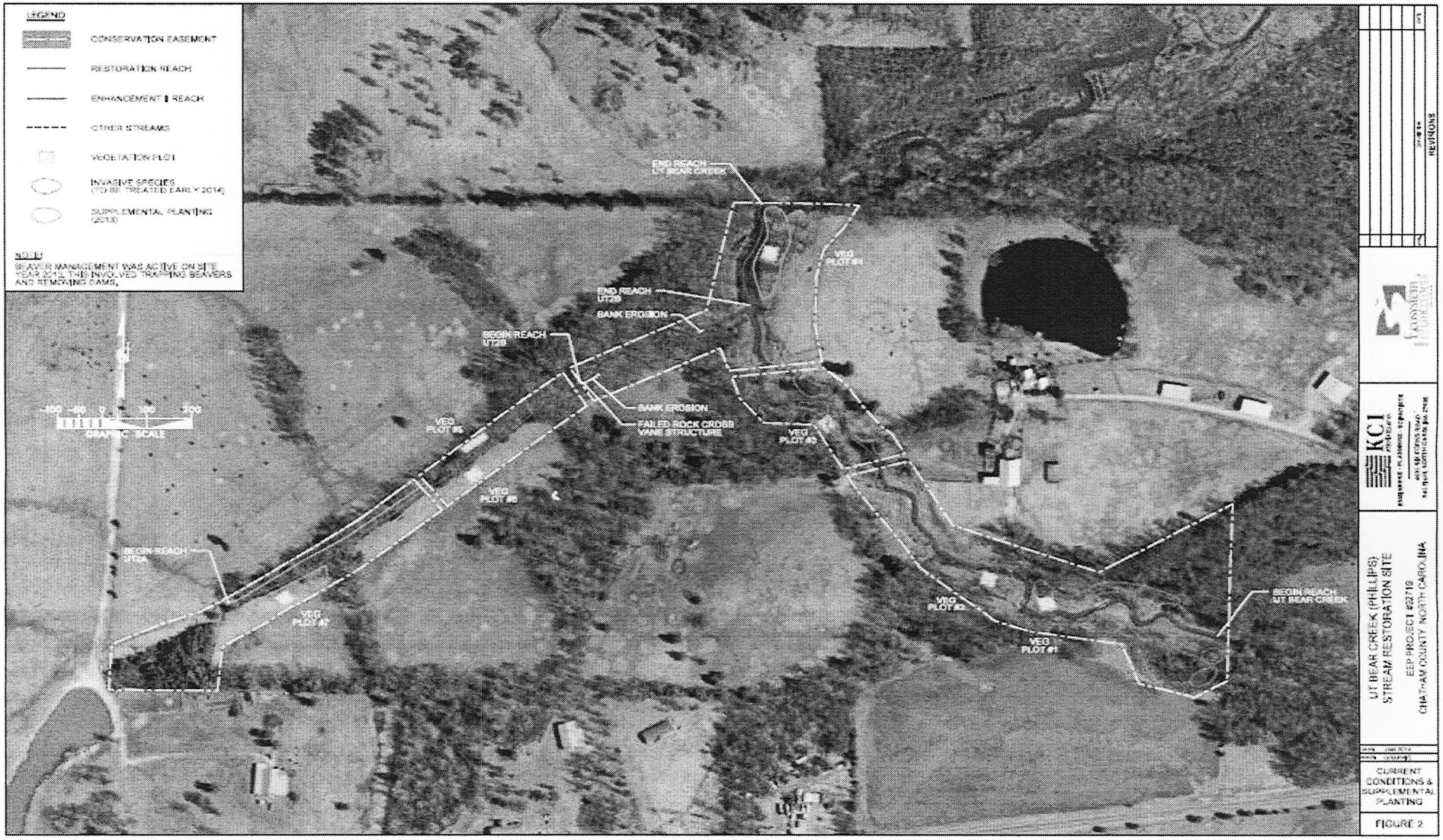
Figure 3. NRCS Soils
UT Bear Creek, Chatham County, EEP Project # 92719

1,000 500 0 1,000 Feet

Image Source: Eastern Piedmont Orthoimagery, 2013

Ecosystem Enhancement Program

KCI ASSOCIATES OF NC


LEGEND
CONSERVATION EASEMENT
RESTORATION REACH
ENHANCEMENT II REACH
OTHER STREAMS
VEGETATION PLOT
INVASIVE SPECIES
SUPPLEMENTAL PLANTING
NOTE:
BEAVER MANAGEMENT WAS ACTIVE ON SITE YEAR 2013. THIS INVOLVED TRAPPING BEAVERS AND REMOVING DAMS.
GRAPHIC SCALE
END REACH UT BEAR CREEK
VEG PLOT #4
END REACH UT2B
BANK EROSION
BEGIN REACH UT2B
BANK EROSION
FAILED ROCK CROSS VANE STRUCTURE
VEG PLOT #6
VEG PLOT #5
VEG PLOT #3
BEGIN REACH UT2A
VEG PLOT #A
VEG PLOT #2
VEG PLOT #1
BEGIN REACH UT BEAR CREEK
KCI
UT BEAR CREEK (PHILLIPS) STREAM RESTORATION SITE
EEP PROJECT #2719
CHATHAM COUNTY, NORTH CAROLINA
CURRENT CONDITIONS & SUPPLEMENTAL PLANTING
FIGURE 2

No Stream Morphological Monitoring Required: No Cross Sectional Data or Longitudinal Profiles Included

Verification of Bankfull Events			
Project Number and Name: 92719 - UT Bear Creek (Phillips)			
Date of Data Collection	**Date of Occurrence**	**Method**	**Photo Number**
11/17/2009	11/13/2009	Site visit to evaluate indicators of stage after storm events	N/A
10/8/2010	9/30/2010	Site visit to evaluate indicators of stage after storm	N/A
8/16/2011	unknown	Crest gauge	N/A
11/5/2012	unknown	Crest gauge	N/A

Ut to Bear Creek As-Built List of Planted Species

STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1

50% SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50% CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES

TYPE 2

20% QUERCUS MICHAUXII	SWAMP CHESTNUT OAK	12 in – 18 in BR
20% QUERCUS PHELLOS	WILLOW OAK	12 in – 18 in BR
20% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
20% PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
20% NYSSA SYLVATICA	BLACK GUM	12 in – 18 in BR

Supplemental Planting List 2013

UT Bear Creek (Phillips) Stream Restoration Site

Species	Type	Quantity	% Planted
Acer negundo	Container	13	6%
Betula nigra	Container	30	15%
Fraxinus pennsylvanica	Container	9	4%
Liriodendron tulipifera	Container	37	18%
Nyssa sylvatica var sylvatica	Container	20	10%
Platanus occidentalis	Container	35	17%
Populus deltoides	Container	9	4%
Quercus michauxii	Container	5	2%
Quercus palustris	Container	15	7%
Quercus phellos	Container	15	7%
Ulmus americana	Container	8	4%
Diospyros virginiana	Container	8	4%
TOTALS		**204**	**100%**

Stream Riparian Buffer Stem Density and Species Count by Plot
UT Bear Creek (Phillips) Stream Restoration Site

Species	Plots							Total Year 5
	1	2	3	4	5	6	7	
Diospyros virginiana		1						1
Fraxinus pennsylvanica	2	5	1	1	13	7	4	33
Juglans nigra				1				1
Platanus occidentalis	5			1				6
Quercus michauxii		2		2		6		10
Quercus phellos		1	7	3		2	1	14
Total (Year 5)	7	9	8	8	13	15	5	65
Average Density (Stems/Acre)	283	364	324	647	526	607	202	
								422

Vegetation History: Stems/Acre Planted and Total with Volunteers
UT Bear Creek (Phillips) Stream Restoration Site

Plot Number	MY-01		MY-02		MY-03		MY-04		MY-05	
	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
1	364	5,099	364	1,214	364	3,561	364	4,209	283	2,711
2	405	890	405	607	364	1,052	364	1,093	364	1,102
3	324	2,307	324	486	324	1,902	324	1,821	324	1,902
4	445	769	405	486	405	688	405	809	324	567
5	526	728	526	688	526	1,295	526	931	526	931
6	607	688	607	607	607	1052	607	931	607	1,051
7	202	850	202	324	202	931	202	1,052	202	1,457
Site Average	410	1,619	405	630	399	1,497	399	890	376	1,194

EEP RECOMMENDATIONS AND CONCLUSION

UT Bear Creek is predominantly stable throughout the project. The area of floodplain erosion that had been noted in previous reports is no longer active. This area has stabilized and is currently vegetated. The beaver dam noted in previous year's monitoring reports that was creating backwater conditions in the lower portions of UT Bear Creek has been removed. Although unnamed tributary 2 has two minor localized areas of adjustment, the reach has been and continues to be stable and functioning as intended. Project areas exhibiting low vegetation density or vigor have been supplementally planted. Supplemental planting of the site was conducted in November of 2013. Five separate zones were planted throughout the easement totaling approximately 0.9 acres. The invasive species present on site will have been treated twice prior to closeout and will be treated again in 2014.

The seven monitoring plots indicated an average of 399 planted stems/acre across the site in year five. Plot 7 is the only plot that has a planted stem density less than the year five success criteria of 260 stems/acre. This plot has 202 planted stems/acre and 1,052 total stems/acre, including volunteers. The site's average stem density including volunteers is 1,549 stems/acre.

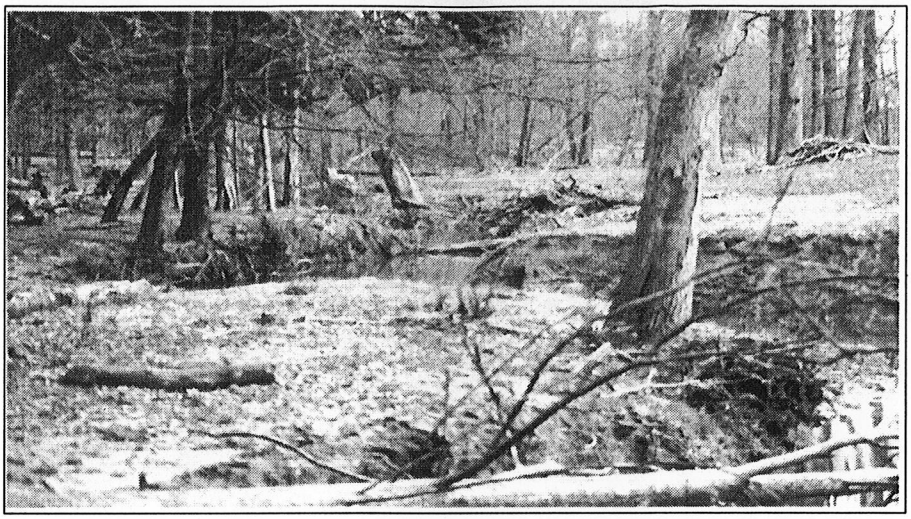
The stream and the site's vegetation condition indicate project success. EEP recommends that this site be closed out generating 2,775 stream mitigation units.

Contingencies

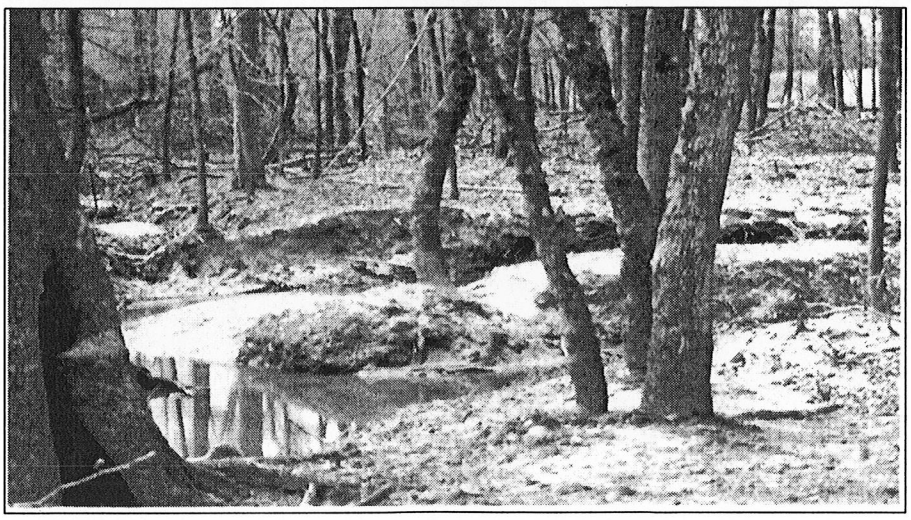
No contingencies are proposed for this site.

Pre-Construction Photos (2003)

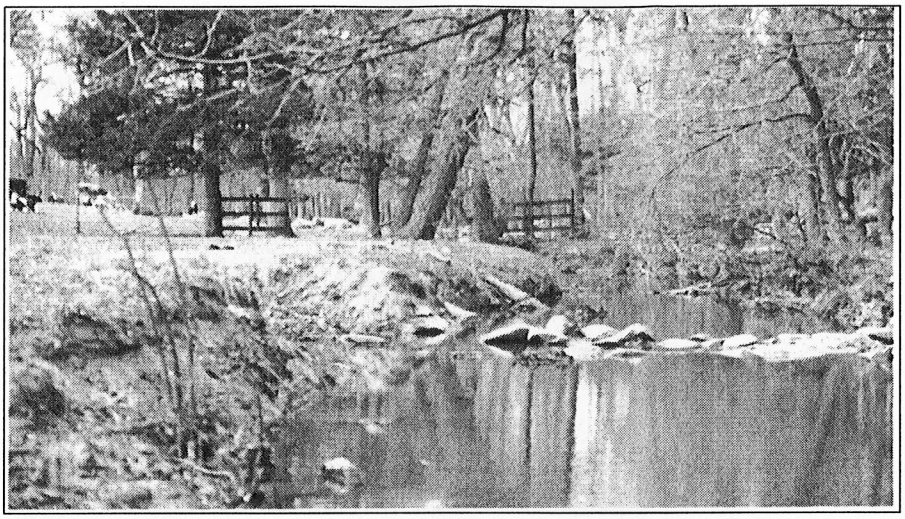
UT to Bear Creek



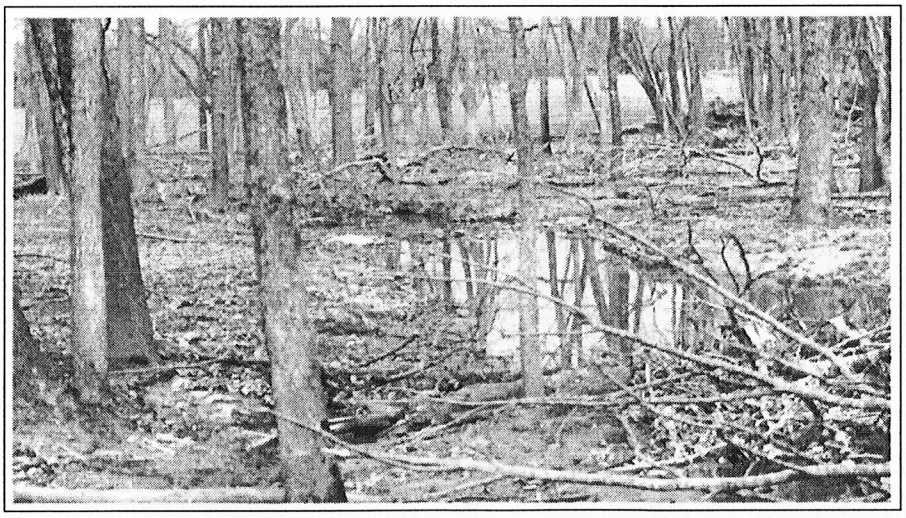
UT to Bear Creek



UT to Bear Creek



UT2



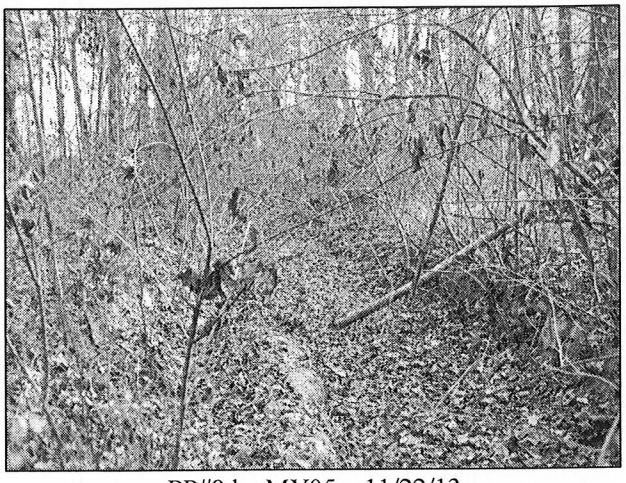
Post-Construction Photos MY-05

PP#2u – MY05 – 11/22/13

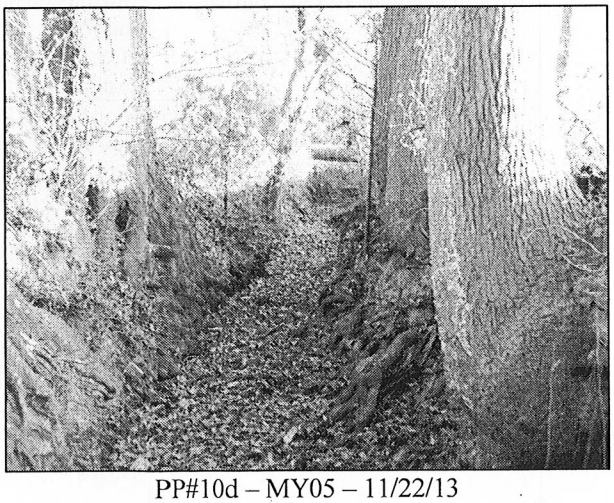
PP#3d – MY05 – 11/22/13

PP#5u – MY05 – 11/22/13

PP#6 – MY05 – 11/22/13



PP#8d – MY05 – 11/22/13



PP#10d – MY05 – 11/22/13

Appendix A – Watershed Planning Summary

92719- UT to Bear Creek (Phillips)

Watershed Characteristic Overview

The UT to Bear Creek project is located in the Upper and Middle Rocky River Local Watershed Plan (LWP), within the Cape Fear River Basin of Chatham County. The 52-square mile Bear Creek watershed (HU 03030003070050) is characterized by 33 percent agricultural land use, with 56 large animal operations, and 28 percent non-forested riparian buffers (2009 Cape Fear RBRP). The NC Natural Heritage Program has identified twenty-three Natural Heritage Element Occurrences (NHEOs) and the Rocky River Subbasin Aquatic Habitat Significant Natural Heritage Area (SNHA) within this watershed.

A portion of Bear Creek downstream of the project site is identified as Impaired on the 2012 NCDWR 303(d) List for impacts to aquatic life. Major causes of stream degradation within this local watershed, as reported in the LWP documents, include urban and agricultural runoff combined with municipal discharges from Siler City.

Links to Watershed Goals and Objectives

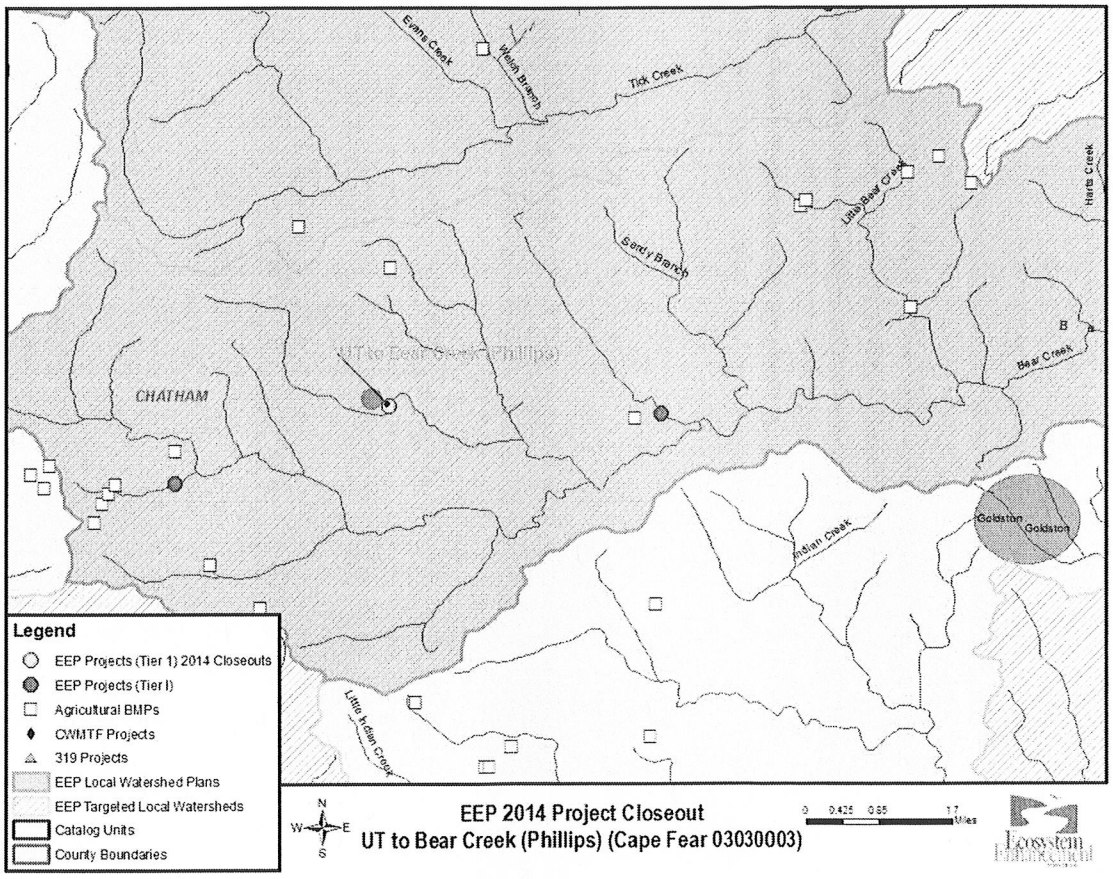
Table 1 below summarizes the major LWP-identified stressors in the Upper and Middle Rocky River watershed, recommended management strategies, and stressor-related objectives achieved by the UT to Bear Creek project which restored approximately 2,378 linear feet of channel of heavily impacted by cattle access.

Table 1. Key watershed stressors and management strategies for the Upper and Middle Rocky River watershed and the benefits provided by the UT to Bear Creek Project

Stressors and Issues	Management Strategies	UT to Bear Creek Project
Stream bank erosion	Stream restoration, riparian buffers, livestock exclusion	• Increasing channel stability. • Restoring dimension, pattern, and profile to UT Bear Creek and UT 2. • Planting riparian buffers.
Lack of adequate forested buffer	Streamside buffer ordinances, improved stream maps, stream restoration, livestock exclusion, wetland restoration	
Stormwater Runoff	Stormwater Retrofit, Enhanced Stormwater Utilities, BMPs, Low impact development (LID), Non-structural stormwater controls	
Livestock access to streams	Livestock exclusion	• Excluding cattle from the stream channels reducing nutrient and fecal coliform inputs. • Planting riparian buffers.
Nutrients	Ag BMPs, riparian buffers, stormwater BMPs, improved water treatment	
Fecal coliform bacteria	Agricultural BMPs, stormwater BMPs	

Watershed Summary

There are two additional EEP mitigation projects within this watershed, Bear Creek (Phillips Tract) and UT to Bear Creek (Weaver/McLeod) which are both stream restoration sites. In addition, there are 19 agricultural BMPs that have been implemented in this watershed including livestock exclusion, waste management, alternative watering, pasture renovation, stream crossing, well installation, backyard wetland, agricultural pond repair/restoration, and heavy use area protection.



APPENDIX B – Land Ownership and Protection

Project Name	Grantor Name	County	Property Rights	Deed/Page	Plat/Page	Acre
UT to Bear Creek (Phillips)	NCDOT	Chatham	Conservation Easement	1091/1	2003/416	11.91

4 PT

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

November 6, 2003

MEMORANDUM TO: Mr. J. M. Mills, P.E.
Division 7 Engineer

FROM: Philip S. Harris, III, P.E., Manager
Office of the Natural Environment
Project Development and
Environmental Analysis Branch

SUBJECT: Guilford County; Greensboro – Western Outer Loop from North of I-85 near Groometown Road to North of High Point Road and from North of Norfolk Southern Railroad to I-40 Interchange; State Work Order Number 8.U492101; WBS Elements 34820.1.8 and 34820.1.10; T.I.P. Numbers U-2524AB and AC

Attached are the U. S. Army Corps of Engineers Individual Permit and the Division of Water Quality 401 for the construction of the above referenced project. All environmental permits have been received for the construction of this project.

PSH/eah

Attachment

cc: Ms. Debbie Barbour, P.E.
Mr. Omar Sultan
Mr. Jay Bennett, P.E.
Mr. David Chang, P.E.
Mr. Randy Garris, P.E.
Mr. Greg Perfetti, P.E.
Mr. Mark Staley
Mr. John F. Sullivan, III, FHWA
Mr. Jerry Parker, Division 7 DEO

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1500
FAX: 919-715-1501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

DEPARTMENT OF THE ARMY PERMIT

Permittee NC Department of Transportation

Permit No. 200321137

Issuing Office USAED, Wilmington

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place fill material impacting a total of 11,460 linear feet of stream, 4.14 acres of wetlands, and 8.62 acres of ponds, for construction of Sections AB and AC of the Greensboro Western Urban Loop (T.I.P. No. U-2524AB and AC), impacting Long Branch, Reddicks Creek and its unnamed tributaries, unnamed tributaries of Bull Run, South Buffalo Creek, and Hickory Creek, and adjacent wetlands.

Project Location:

From I-85, to I-40, on the southwest side of Greensboro, in Guilford County, North Carolina.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2006. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

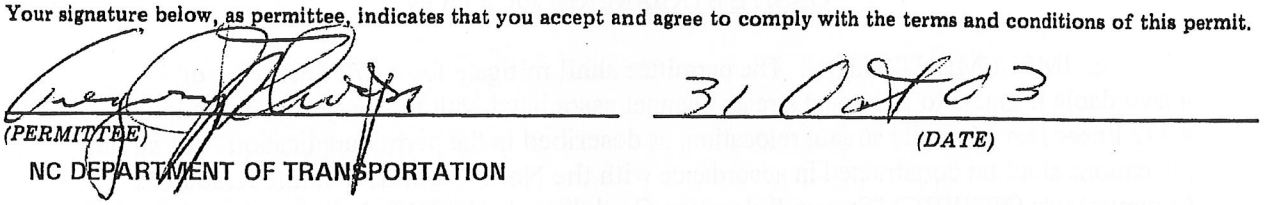
b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.



(PERMITTEE) *(DATE)*

NC DEPARTMENT OF TRANSPORTATION

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT ENGINEER) *(DATE)*

CHARLES R. ALEXANDER, JR. COLONEL

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

☆U.S. GOVERNMENT PRINTING OFFICE: 1986 — 717-425

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

IN REPLY REFER TO

SPECIAL CONDITIONS (Action ID. 200321137; NCDOT/TIP U-2524AB & AC)

a. All work authorized by this permit must be completed in strict compliance with the attached plans, which are a part of this permit. The permittee will ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any deviation in the construction design plans will be brought to the attention of the Corps of Engineers, Raleigh Regulatory Field Office prior to any active construction in waters or wetlands.

b. The permittee shall mitigate for 8,905 linear feet of important stream impact and 4.14 acres of emergent marsh, emergent seep, and headwater and palustrine forest wetland impact for this project, as described below (4,472 linear feet of stream re-location, 1.32 acres of wetland restoration at the Sandy Creek wetland mitigation site, 15.84 acres of wetland restoration at the Blue Tract wetland mitigation site, 1,195 linear feet of stream restoration and stream enhancement at the Woodlyn Way stream mitigation site, 6,679 linear feet of stream restoration and stream preservation at the Tick Creek stream mitigation site, and 1,806 linear feet of stream restoration at the UT Bear Creek stream mitigation site).

ONSITE STREAM RELOCATION

c. IMPLEMENTATION: The permittee shall mitigate for 4,472 linear feet of unavoidable impacts to perennial stream channel associated with this project by completing 4,472 linear feet of onsite stream relocation, as described in the permit application. All stream relocations shall be constructed in accordance with the North Carolina Wildlife Resources Commission's (NCWRC) "Stream Relocation Guidelines." NCDOT shall consult with NCWRC on all stream relocations and implement all practicable recommendations in the design of specific site requirements for re-establishment of bank vegetation, and placement of meanders and habitat structures. Vegetation shall be used to the maximum extent practicable to stabilize banks, and riprap and other man-made structural measures shall be minimized. The relocations shall be constructed in a dry work area, and stabilized before the stream is diverted.

d. AS-BUILT SURVEY: The permittee shall complete an as-built channel survey within sixty days of completion of the stream relocation construction. The permittee shall document changes in the dimension, pattern, profile, vegetation plantings, and structures installed, of the relocated channel from the proposed design. The permittee shall also include in the as-built survey: photo documentation at representative segments and structures; and a plan view diagram.

e. MONITORING SCHEDULE: The permittee shall perform the following components of Level I monitoring each year for the 5-year monitoring period: Reference photos; plant survival (i.e., identify specific problem areas (missing, stressed, damaged or dead plantings), estimated causes, and proposed/required remedial action); visual inspection of channel stability.

Physical measurements of channel stability/morphology will not be required. The permittee shall submit the monitoring reports to the Corps of Engineers, Raleigh Regulatory Field Office Project Manager, within sixty days after completing the monitoring. If less than two bankfull events occur during the first 5 years, the permittee shall continue monitoring until the second bankfull event is documented. The bankfull events must occur during separate monitoring years. In the event that the required bankfull events do not occur during the five-year monitoring period, the Corps of Engineers, in consultation with the resource agencies, may determine that further monitoring is not required. It is suggested that all bankfull occurrences be monitored and reported through the required monitoring period. The permittee shall perform and submit photo documentation twice each year (summer and winter) for the 5-year monitoring period, and for any subsequently required monitoring period.

f. MONITORING DATA/REPORT: The permittee shall include the following information in the Level I monitoring report for the site: reference photos; plant survival notes and recommendations, as appropriate; and a report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. The permittee shall complete the Monitoring Data Record, Sections 1, 2 and 3 (pages 1, 2 and 3, attached), for each representative segment of the channel, and for each year of monitoring (twice each year (summer and winter) for reference photos). The permittee shall include in the monitoring reports a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situation.

g. STREAM RELOCATION SUCCESS CRITERIA: The relocation success criteria, and required remediation actions, will be generally based on the attached Appendix II, and the Photo Documentation, Ecological Function, and Channel Stability criteria in the "Stream Mitigation Guidelines", dated April, 2003 (available on the internet at http://www.saw.usace.army.mil/wetlands/Mitigation/stream_mitigation.html), pages 24 and 25, under "Success Criteria: ".

SANDY CREEK WETLANDS RESTORATION

h. The permittee shall provide the restoration described in condition i. below through continued implementation of the compensatory wetland mitigation plan "Wetland Mitigation Plan – Sandy Creek Site", dated April, 1999.

i. The permittee shall mitigate for 0.66 acre of unavoidable impacts to wetlands associated with this project with 1.32 acres of wetland restoration at the Sandy Creek Mitigation Site.

j. NCDOT will do a survey of the 1.32 acres of wetland restoration at the Sandy Creek Mitigation Site, and submit a copy of the survey to the District Engineer within 60 days after the survey is completed.

k. The permittee will continue monitoring the site vegetation between June 1 and November 30, inclusively, of each year, and document plant mortality and stress. A minimum of three 0.05 acre sample plots will be used for the entire site. The permittee will continue monitoring of the planting areas annually until the respective performance criteria are met, as described below.

SANDY CREEK MITIGATION MONITORING

l. Performance criteria for tree planting areas will be met if sample plots demonstrate that for each of the first three complete years of monitoring, 320 target-species trees per acre have survived, such that at the end of three years, 320 three-year old target-species trees per acre have survived on the site, and, in years four and five, 288 and 260 trees per acre, respectively, have survived on the site, such that at the end of year five, 260 five-year old target-species trees per acre have survived on the site.

m. If for any monitoring year, vegetation survival is not favorable, as determined by the Corps of Engineers, any remedial action required by the Corps of Engineers will be performed, the required restoration areas will be replanted, and the five-year monitoring period will begin again with year one.

n. Hydrology in the restoration areas will be monitored through the use of monitoring gauges during each growing season for the first five years of the vegetative monitoring, or until performance criteria have been met, whichever occurs later. A minimum of six groundwater gauges will be used within the total wetland restoration area at Sandy Creek.

o. To meet the hydrology success criteria, the monitoring data must show that for each normal precipitation year within the monitoring period, the site has been inundated or saturated within the upper 12 inches of the soil for a minimum of 12.5% of the growing season (29 consecutive days for Randolph County). WETS tables for Randolph County will be utilized as appropriate to determine normal precipitation years.

p. If there are no normal precipitation years during the first five years of monitoring, to meet performance criteria, the permittee will continue to monitor hydrology on the site until it shows that the site has been inundated or saturated as described above during a normal precipitation year.

q. In the alternative, and at the Corps' discretion, a site may be found to meet the hydrology performance criteria on the basis of comparison of monitoring data taken from the site with monitoring data taken from an established jurisdictional mitigation reference site approved by the Corps. The Corps retains the discretion to find that the hydrology criteria are met if such monitoring data from the mitigation site and the reference site are substantially the same. This finding by the Corps may be made during years with or without normal rainfall.

r. In the event there are years of normal precipitation during the monitoring period, and the data for those years do not show that the site has been inundated or saturated within the upper 12 inches of the soil for a minimum of 12.5 % of the growing season (29 consecutive days) during a normal precipitation year, the Corps may require remedial action. The permittee shall

perform such required remedial action, and continue to monitor hydrology on the site until it displays that the site has been inundated or saturated as described above, during a normal precipitation year. If the Corps determines that further remediation is not appropriate, other options will be considered, including use of a different site to mitigate for project impacts.

s. The permittee will submit yearly mitigation monitoring reports by the first day of February after each assessment period, for five years following final site manipulation. These reports will include, at a minimum, sample plot, well and rainfall data; number of individuals of each tree species within each sample plot; photographs, including a location key; and problems/resolution, and will be provided to both the Corps and the North Carolina Division of Water Quality.

BLUE TRACT WETLANDS PRESERVATION

t. The permittee shall continue implementation of the compensatory wetland mitigation plan entitled "Blue Tract Mitigation Planning Document", dated June 11, 2001, to provide the preservation described in condition u. below.

u. The permittee shall mitigate for 0.66 acres of unavoidable impacts to wetlands associated with this project with 15.84 acres of wetland preservation, and additional upland buffer and stream preservation, at the Blue Tract Mitigation Site.

v. NCDOT will submit a copy of a survey of the 15.84 acres of wetland preservation at the Blue Tract Mitigation Site, to the District Engineer within 90 days after this permit is issued.

GENERAL WETLANDS MITIGATION

w. The permittee and/or current and subsequent property owners shall maintain the Sandy Creek and Blue Tract mitigation sites in their natural condition, as altered by work in the mitigation plans, in perpetuity. Prohibited activities within the mitigation sites specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading, excavation, leveling, or any other earth moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plans, or subsequent modifications that are approved by the Corps of Engineers. In addition, the permittee shall take no action, whether on or off the mitigation properties, which will adversely impact the wetlands or streams on the mitigation properties, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers.

x. The permittee shall make every effort to convey the Sandy Creek, and Blue Tract Mitigation Site properties to a nonprofit conservation organization or a natural resource agency, which is willing to hold the areas in perpetuity for conservation purposes, and which is

acceptable to the Corps of Engineers. The annual monitoring reports, as required, will include the status of the conveyance efforts.

y. The permittee shall not sell or otherwise convey any interest in the wetland mitigation properties used to satisfy mitigation requirements for this permit, to any third party, without 10 days prior notification to Wilmington District Corps of Engineers in writing, which writing shall reference this permit Action ID number.

z. Any sale, lease, or other conveyance of the wetland mitigation site properties shall include restrictions on the use of the properties as described in condition w. above, which conditions shall be enforced by the North Carolina Department of Transportation. Such restrictions shall include language providing for third party enforcement rights in favor of the Corps of Engineers. Such restrictions must be approved by the Corps of Engineers prior to conveyance.

WOODLYN WAY STREAM MITIGATION

aa. The permittee shall mitigate for 381 linear feet of impacts to stream channel associated with this project with 1,150 linear feet of stream restoration and 45 linear feet of stream enhancement, as described in the "Woodlyn Way Stream Mitigation Plan, Guilford County, North Carolina", dated January 2002 (Action ID. 200220514). The permittee shall complete the construction and planting at the Woodlyn Way Mitigation Site concurrently with the construction of TIP U-2524AB and AC.

TICK CREEK STREAM MITIGATION

bb. The permittee shall mitigate for 2,095 linear feet of impacts to stream channel associated with this project with 2,946 linear feet of stream restoration and 3,733 linear feet of stream preservation, as described in the "Stream Mitigation Plan, Tick Creek, Condoret Property, Chatham County, North Carolina", dated September 2002 (Action ID. 200320295). The permittee shall complete the construction and planting at the Tick Creek Mitigation Site by December 31, 2004.

UT BEAR CREEK STREAM MITIGATION

cc. The permittee shall mitigate for 1,145 linear feet of impacts to stream channel associated with this project with 1,806 linear feet of stream restoration, as described in the "UT Bear Creek Mitigation Plan, Chatham County, North Carolina", dated June 2003 (Action ID. 200320314), to the extent necessary to provide the required mitigation. The permittee shall complete all the construction and planting at the UT Bear Creek Mitigation Site, by December 31, 2004.

dd. PROHIBITED ACTIVITIES: The permittee, and current and subsequent property owners, shall maintain the Woodlyn Way, Tick Creek, and UT Bear Creek stream mitigation sites in their natural condition, as altered by work in the mitigation plan and subsequent remediation, in perpetuity. Prohibited activities within the mitigation sites specifically include, but are not limited to: the construction or placement of roads, walkways, buildings, signs, or structures of any kind (i.e., billboards, interior fences, etc.); filling, grading, excavation, leveling, or any other earth moving activity or activity that may alter the drainage patterns on the property; the cutting, mowing, destruction, removal, or other damage of any vegetation, except as specifically stated in the mitigation plan; disposal or storage of any debris, trash, garbage, or other waste material; except as may be authorized by the mitigation plans, or subsequent modifications that are approved by the Corps of Engineers. In addition, the permittee, and current and subsequent property owners, shall take no action, whether on or off the mitigation properties, which will adversely impact the streams on the mitigation properties, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers.

ee. AS-BUILT SURVEY: The permittee shall complete an as-built channel survey for each of the three sites within sixty days of completion of the stream mitigation construction at each site. The permittee shall document changes in the dimension, pattern, profile, vegetation plantings, and structures installed, of the constructed channel from the proposed design. The permittee shall also include in the as-built surveys: photo documentation at representative segments and structures; and plan view diagrams.

ff. MONITORING SCHEDULE: The permittee shall perform the following components of Level I monitoring each year of a 5-year monitoring period: Reference photos; plant survival (i.e., identify specific problem areas (missing, stressed, damaged or dead plantings), estimated causes, and proposed/required remedial action); visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. The permittee shall submit the monitoring reports to the Corps of Engineers, Raleigh Regulatory Field Office Project Manager, within sixty days after completing the monitoring. If less than two bankfull events occur on either site during the first 5 years, the permittee shall continue monitoring that site until the second bankfull event is documented. The bankfull events must occur during separate monitoring years for each site. In the event that the required bankfull events do not occur during the five-year monitoring period, the Corps of Engineers, in consultation with the resource agencies, may determine that further monitoring is not required. It is suggested that all bankfull occurrences be monitored and reported through the required monitoring period. The permittee shall perform and submit photo documentation for each site twice each year (summer and winter) for the 5-year monitoring period, and for any subsequently required monitoring period.

gg. MONITORING DATA/REPORT: The permittee shall include the following information in the Level I monitoring report for each site: reference photos; plant survival notes and recommendations, as appropriate; and a report on the visual inspection of channel stability. Physical measurements of channel stability/morphology will not be required. The permittee shall complete the Monitoring Data Record, Sections 1, 2 and 3 (pages 1, 2 and 3, attached), for each

representative segment of the channels, and for each year of monitoring (twice each year for each site, summer and winter, for reference photos). The permittee shall include in the monitoring reports a discussion of any deviations from as-built and an evaluation of the significance of these deviations and whether they are indicative of a stabilizing or destabilizing situations.

hh. STREAM MITIGATION SUCCESS CRITERIA: The mitigation success criteria, and required remediation actions, will be generally based on the attached Appendix II, and the Photo Documentation, Ecological Function, and Channel Stability criteria in the "Stream Mitigation Guidelines", dated April, 2003 (available on the internet at http://www.saw.usace.army.mil/wetlands/Mitigation/stream_mitigation.html), pages 24 and 25, under "Success Criteria: ".

WOODLYN WAY, TICK CREEK AND UT BEAR CREEK
SITE PROPERTY DISPENSATION

ii. The permittee shall purchase the mitigation sites in fee simple, or shall secure a conservation easement on the mitigation sites, to ensure the maintenance of the mitigation sites by the current and subsequent property owners, in their natural condition, as altered by work in the mitigation plans, in perpetuity. In addition, the permittee, and current and subsequent property owners, shall take no action, whether on or off the mitigation properties, which will adversely impact the streams on the mitigation properties, except as specifically authorized by this permit, or subsequent modifications that are approved by the Corps of Engineers.

PRE-CONSTRUCTION

jj. Prior to commencing construction within jurisdictional waters of the United States, the permittee shall forward the latest version of project construction drawings to the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager. Half-size drawings are acceptable.

kk. The permittee shall schedule an environmental preconstruction meeting between its representatives, the contractor's representatives, and the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all of the terms and conditions contained within this Department of the Army Permit. The permittee shall provide the Corps of Engineers, Raleigh Regulatory Field Office NCDOT Regulatory Project Manager, with a copy of the final plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The permittee shall schedule the environmental preconstruction meeting for a time when the Corps of Engineers and North Carolina Division of Water Quality (NCDWQ) Project Managers can attend. The permittee shall invite the Corps and NCDWQ Project Managers a minimum of four weeks in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting.

ll. The permittee and its contractors and/or agents shall not excavate, fill, or perform mechanized landclearing at any time in the construction or maintenance of this project within waters and/or wetlands, except as authorized by this permit, or any modification to this permit. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and fill activities connected with this project.

mm. To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent wetlands and streams, except as authorized by this permit, the permittee shall require its contractors and/or agents to identify all areas to be used to borrow material, or to dispose of dredged, fill, or waste material. The permittee shall ensure that all such areas comply with the preceding condition (ll.) of this permit, and shall require and maintain documentation of the location and characteristics of all borrow and disposal sites associated with this project. This information will include data regarding soils, vegetation and hydrology sufficient to clearly demonstrate compliance with the preceding condition (ll.). All information will be available to the Corps of Engineers upon request. NCDOT shall require its contractors to complete and execute reclamation plans for each waste and borrow site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the Corps of Engineers within 30 days of the completion of the reclamation work.

nn. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit.

oo. The permittee shall implement the recommendations (1 – 7) in the attached September 16, 2003 letter from the North Carolina Wildlife Resources Commission, with the exception that NCDOT shall not be required to install alternating or notched baffles in culverts with slopes less than 0.5%.

WATER QUALITY CERTIFICATION

pp. The permittee shall comply with the conditions specified in the water quality certification, No. 3435 (modification), issued by the North Carolina Division of Water Quality on October 24, 2003.

qq. The permittee shall conduct construction in such a manner as to prevent a significant increase in turbidity outside the area of construction or construction-related discharge. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to assure compliance with the appropriate turbidity water quality standards.

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E., Director
Division of Water Quality
Coleen H. Sullins, Deputy Director
Division of Water Quality

October 24, 2003

Mr. Gregory J. Thorpe, Ph.D., Environmental Director
NCDOT Planning and Environmental Branch
1548 Mail Service Center
Raleigh, NC, 27699-1548

Dear Dr. Thorpe:

Re: MODIFICATION TO Water Quality Certification Pursuant to §401 of the Federal Clean Water Act, Greensboro Western Urban Loop, from I-85 south of Groometown to south of I-40 Interchange, Guilford County.
F.A. Project No. STPNHF-NHF-124-1(1); State Project No. 8.U492101
TIP No. U-2524 AB/AC and AB Part I
DWQ Project No. 030909

Attached hereto is a copy of the Modification to Certification No. 3435 issued to The North Carolina Department of Transportation dated October 24, 2003.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Alan W. Klimek, P.E.

Attachments

cc: Wilmington District Corps of Engineers
Eric Alsmeyer, USACE Raleigh Field Office
NCDWQ Winston-Salem Regional Office
Christopher Militscher, US Environmental Protection Agency – Region IV
Ron Ferrell, NC Wetlands Restoration Program
William D. Gilmore, P.E., Transition Manager, NC DENR Division of Ecosystem Enhancement
Central Files
File Copy

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, .0500. This Certification authorizes the NCDOT to incur the following permanent impacts:

- 4.14 acres of wetlands through fill, excavation and mechanized clearing;
- 3.92 acres of fill in ponds;
- 4,610 linear feet of on-site stream relocation
- 6,919 linear feet of jurisdictional stream loss;
- 20.46 acres of Zone 1 Randleman Lake Riparian Buffers
- 11. 79 acres of Zone 2 Randleman Lake Riparian Buffers

The U-2524 AB/AC and AB Part I projects shall be constructed pursuant to the application dated July 21, 2003 and Modification request dated October 24, 2003 to construct the Greensboro Western Urban Loop from I-85 south of Groometown to south of I-40 Interchange in Guilford County.

The Application provides adequate assurance that the discharge of fill material into the waters of the state with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your Application. All work authorized by this Certification must be done in strict compliance with the plans attached to the Application. If this project changes, incurring additional impacts to streams, wetlands or buffers, you are required to notify the DWQ *in writing*, and you may be required to submit a new application. Additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion Control, Non-discharge and Water Supply watershed regulations. This Certification shall expire three (3) years from the date of the cover letter from DWQ or on the same day as the expiration date of the corresponding US Army Corps of Engineers Permit, whichever is later.

Condition(s) of Certification:

1. Construction shall be performed so that no violations of state water quality standards, statutes, or rules occur.
   a. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface water quality standards.
   b. The erosion and sediment control measures for the U-2524AB/AC and AB Part I projects must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*. These devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the projects included under this Certification.
   c. For borrow pit sites, the erosion and sediment control measures must equal or exceed the proper design, installation, operation and maintenance outlined in the most recent version of the *North Carolina Surface Mining Manual*.
   d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

e. NCDOT shall strictly adhere to North Carolina regulations entitled, *Design Standards in Sensitive Watersheds* (15A NCAC 4B .0124 (b) –(e) *only*), for activities undertaken in all waters classified as WS (Water Supply) and draining to the Critical Area, including: Hickory Creek, Reddick's Creek and Bull Run, as well as their unnamed tributaries. NCDOT will *not* be required to comply with 15A NCAC 2B .0124(a), which restricts clearing to 20 acres at a time.

2. For streams *in* the Randleman Lake Watershed (Hickory Creek, Reddick's Creek and Bull Run and their unnamed tributaries), stormwater shall be directed to flow as diffuse flow at non-erosive velocities across the stream buffers using level spreaders, retention basins, pre-formed scour holes or other site-appropriate devices. For all streams that are *not* in the Randleman Lake watershed (South Buffalo Creek and its unnamed tributaries), stormwater shall be transported by vegetated conveyance before discharge into the streams. In either case, stormwater shall not be routed to flow directly into streams. Existing wooded stream buffers shall not be mowed in order to allow them to provide diffuse stormwater flow and/or streambank stabilization.

3. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within 30 days after the project has been released.

4. The outside buffer, wetland or water boundary as well as along the construction corridor within these boundaries approved under this authorization shall be clearly marked by orange fabric fencing for the areas that have been approved to infringe within the buffer, wetland or water prior to any land disturbing activities to ensure compliance with 15A NCAC 2B .0250.

5. NCDOT and its contractors and/or agents shall not excavate, fill, or perform mechanized land clearing at any time in the construction or maintenance of this project within waters and/or wetlands, except as authorized by this Certification, or any modification to this Certification. There shall be no excavation from or waste disposal into jurisdictional wetlands or waters associated with this Certification without appropriate modification. If this occurs, compensatory mitigation will be required since it is a direct impact from road construction activities.

6. Excavation of stream crossings should be conducted in the dry unless demonstrated by the applicant or its authorized agent to be unfeasible. Sandbags, cofferdams, flexible pipe, or other diversion structures should be used to minimize excavation in flowing water.

7. Live or fresh concrete shall not come into contact with waters of the state until the concrete has hardened.

8. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.

9. The natural dimension, pattern and profile of the stream above and below the crossing should not be modified by widening the stream channel or changing the depth of the stream.

10. The removal of vegetation in riparian areas should be minimized. NCDOT is encouraged to use existing on-site vegetation and materials for stream bank stabilization and to minimize the use of rip rap. Riprap shall not be placed in the stream bottom.

11. Riparian vegetation, using native trees and shrubs, must be re-established within the construction limits of the project by the end of the growing season following completion of construction to reestablish the riparian zone and to provide long-term erosion control.

12. Placement of culverts and other structures in waters, streams, and wetlands shall be placed below the elevation of the streambed to allow low flow passage of water and aquatic life unless it can be shown to DWQ that providing passage would be impractical. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium shall be maintained if requested in writing by DWQ.

13. Heavy equipment should be operated from the bank rather than in the stream channel unless demonstrated by the applicant or its authorized agent to be unfeasible. All mechanized equipment operated near surface waters should be inspected and maintained regularly to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids or other toxic substances.

14. *On-Site Stream Relocations:* The five on-site stream relocations (listed below) shall utilize natural channel design:
    - AB Part 1 Site 7 from Sta. 11+60 to Sta. 11+67 –40SB REV-
    - AB Part 1 Site 17 from Sta. 11+00 to Sta. 13+00 –40 SB REV-
    - AB Site 3 from Sta. 34+00 to Sta. 37+10 –L-
    - AC Site 1 from Sta. 57+80 Lt to Sta. 58+57 Rt –L-
    - AC Site 2BA from Sta. 101+80 –L- to Sta. 12+70 –Ramp D-
        - The relocations must be constructed in a dry work area, and stabilized before the stream flow is diverted. Each stream relocation shall be completed and stabilized prior to diverting water into the new channels. The channels must be allowed to stabilize for an entire growing season. Vegetation used for bank stabilization shall be limited to native woody species, and should include establishment of a 30-foot wide wooded and an adjacent 20-foot wide vegetated buffer on both sides of each relocated channel to the *maximum extent practical*. A transitional phase incorporating coir fiber and seedling establishment is allowable. Rip-rap may be allowed if it is necessary to maintain the physical integrity of the stream, but the Applicant must provide written justification and the calculations used to determine the extent of rip-rap coverage requested.
        - If any of the relocated channels or the associated riparian area has been determined to be unstable, the stream shall be repaired or stabilized using only natural channel design techniques. Additionally, the vegetation in the riparian area shall be maintained and/or replaced according to the approved plans. Rip-rap and other hard structures may *only* be used if required by the Division of Land Resources or a Delegated Local Program. Additionally, all repair designs must be submitted to and receive written approval from the Division before the repair work is performed.
        - Monitoring for geomorphological stability shall be performed for each relocated channel in accordance with accepted protocols established by US Army Corps of Engineers (USACE) and NCDWQ.
        - Biological Monitoring shall be performed in accordance with the Stream Restoration protocols found in the *Interim, Internal Technical Guide Summary: Benthic Macroinvertebrate Monitoring Protocols for Compensatory Stream Restoration and Enhancement Level 1 Projects* (NC Division of Water Quality, 401 Water Quality Certification Program, May 16, 2001 http://h2o.enr.state.nc.us/ncwetlands/strnmito.htm).
        - The relocated channels and associated riparian buffer areas shall be preserved in perpetuity through a deed notification, preservation easement or some other legally

binding mechanism or agreement. The easements or other legally binding mechanisms or agreements must be in place before any construction impacts approved under this Certification can take place. The NCDOT Division 9 Right of Way Office shall provide NCDWQ with evidence that the additional right of way has been purchased within two (2) months of issuance of the US Army Corps of Engineers 404 Permit.

- The on-site stream relocation must be completely constructed and maintained according to the plans approved by the Division before the Greensboro Western Urban Loop (TIP U-2524 AB/AC and AB Part 1) is opened and any mitigation credit is given.

15. *Mitigation:* Compensatory mitigation shall be the same as that approved by the US Army Corps of Engineers as long as the mitigation required equals a ratio of 1:1 restoration or creation of lost wetland acres as described in 15A NCAC 2H.0506 (h)(6).

Wetland Mitigation

Compensatory mitigation for 4.14 acres of wetland impacts shall be provided through the following schemes:

- NC Wetlands Restoration Program (WRP) has agreed to provide compensatory mitigation for 2.82 acres of wetland impacts incurred for construction of U-2524AB Part 1. DWQ acknowledges that this payment has been made under the §401 WQC for TIP Project No. I-2402 (reference WRP letter of September 6, 1999).
- NCDOT proposes to use 1.32 acres of mitigation from Sandy Creek Mitigation Site in Randolph County (HU 03030003). This site has been approved by NCDWQ.
- NCDOT proposes to use preservation credits from Blue Tract Mitigation Site in Moore County (HU 0303004) at a 12:1 ratio for 7.92 acres of mitigation. This site and the mitigation ratios have previously been approved by Federal and State resource agencies.

Randleman Riparian Buffer Mitigation

NC Division of Ecological Enhancement (DEE) has agreed to provide compensatory mitigation in a letter dated September 25, 2003. NCDOT will be paying into the WRP for the DEE to perform the mitigation work. The buffer impacts and mitigation are as follows:

Zone	*Impacts (ac.)*	*Mitigation (ac.)*
1	18.09	45.96
2	10.23	14.30
		60.26 ac. total

Stream Mitigation

NCDOT proposes to use the following sites as compensatory mitigation for 7,171 linear feet of stream impacts incurred for construction of U-2524AB Part 1:

- Woodlyn Way Mitigation Site
- Tick Creek Mitigation Site
- UT to Bear Creek Mitigation Site

Site Name	*Available Mit'n.*	*Mitigation Used*	*Remaining Mit'n.*
Woodlyn Way	1,195	1,195	0
Tick Creek	4,190	4,190	0
UT Bear Creek	3,850	1,806	2,044
Total	9,235	7,191	2,044

- NCDOT shall provide 100% design plans for the UT to Bear Creek site within three (3) months of issuance of this Modification.

In accordance with 15A NCAC 2R.0500, this contribution will satisfy NC Division of Water Quality's compensatory mitigation requirements under 15A NCAC 2H.0506(h). Until the WRP receives and clears your payments for the Randleman buffer mitigation, wetland or stream fill shall not occur. The payment to NCWRP shall be sent within two (2) months of issuance of the 404 permit.

16. Two copies of the final construction drawings shall be furnished to NCDWQ prior to the pre-construction meeting. Written verification shall be provided that the final construction drawings comply with the attached permit drawings contained in the Application dated July 21, 2003.

17. Upon completion of the project, the NCDOT shall complete and return the enclosed "Certification of Completion Form" to notify DWQ when all work included in the 401 Certification has been completed. The responsible party shall complete the attached form and return it to the 401/Wetlands Unit of the Division of Water Quality upon completion of the project.

18. NCDOT and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State law and Federal law. If DWQ determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, DWQ may reevaluate and modify this certification to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the certification, DWQ shall notify NCDOT and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to NCDOT in writing, shall be provided to the United States Army Corps of Engineers for reference in any permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.

NCDOT shall require its contractors (and/or agents) to comply with all of the terms of this Certification, and shall provide each of its contractors (and/or agents) a copy of this Certification.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal Permit. This Certification shall expire upon the expiration of the 404 Permit.

If you do not accept any of the conditions of this certification, you may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. To ask for a hearing, send a written petition that conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This Certification and its conditions are final and binding unless you ask for a hearing.

This the 24th day of October 2003

DIVISION OF WATER QUALITY

Alan W. Klimek, P.E.

WQC No. 3435

DWQ Project No.: _____ County: _____

Applicant: _____

Project Name: _____

Date of Issuance of 401 Water Quality Certification: _____

Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return this certificate to the 401/Wetlands Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650. This form may be returned to DWQ by the applicant, the applicant's authorized agent, or the project engineer. It is not necessary to send certificates from all of these.

Applicant's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Agent's Certification

I, _____, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification, the approved plans and specifications, and other supporting materials.

Signature: _____ Date: _____

Engineer's Certification

_____ Partial _____ Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project, for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the 401 Water Quality Certification, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____

Date _____

NORTH CAROLINA – DIVISION OF WATER QUALITY
401 WATER QUALITY CERTIFICATION
SUMMARY OF PERMITTED IMPACTS AND MITIGATION REQUIREMENTS

In accordance with 15A NCAC 2H.0500, NCDOT, DWQ Project No. 030909, is authorized to impact the surface waters of the State of North Carolina as indicated below for the purpose of constructing Greensboro Western Urban Loop from I-85 south of Groometown to south of I-40 interchange (TIP Nos. U-2524AB/AC and AB Part 1). All activities associated with these authorized impacts must be conducted in accordance with the conditions listed in the attached certification transmittal letter. **THIS CERTIFICATION IS NOT VALID WITHOUT THE ATTACHMENTS.**

COMPENSATORY MITIGATION REQUIREMENTS FOR RANDLEMAN BUFFER RESTORATION:

LOCATION: Greensboro Western Urban Loop from I-85 south of Groometown to south of I-40 interchange.
COUNTY: Guilford
BASIN/SUBBASIN: Cape Fear River Basin, Cataloging Unit 03030002

As required by 15A NCAC 2B .0250 and 15A NCAC 2H .0506(h), and the conditions of this certification, you are required to compensate for impacts through the restoration, creation, enhancement or preservation of wetlands, buffers, and surface waters as outlined below *prior* to conducting any activities that impact or degrade waters of the state.

The Randleman buffer impacts and mitigation (to be performed by NC DENR Division of Ecological Enhancement) are as follows:

Zone	*Impacts (ac.)*	*Mitigation (ac.)*
1	18.09	45.96
2	10.23	14.30
		60.26 ac. total

Note: Acreage requirements proposed to be mitigated through the Wetland Restoration Program must be rounded to one-quarter increments according to 15A 2R .0503(b).

One of the options you have available to satisfy the compensatory mitigation requirements is through payment of a fee to the Wetland Restoration Program per 15A NCAC 2R .0503. If you choose this option, please sign this form and mail it to the Wetlands Restoration Fund at the address listed below. An invoice for the appropriate amount of payment will be sent to you upon receipt of this form. PLEASE NOTE, THE ABOVE IMPACTS ARE NOT AUTHORIZED UNTIL YOU RECEIVE NOTIFICATION THAT YOUR PAYMENT HAS BEEN PROCESSED BY THE WETLANDS RESTORATION PROGRAM.

_____ _____

Signature Date

WETLANDS RESTORATION PROGRAM
DIVISION OF WATER QUALITY
1619 Mail Service Center
RALEIGH, NC, 27699-1619
(919) 733-5219

2003-2-1137

North Carolina Wildlife Resources Commission

Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Eric Alsmeyer, U.S. Army Corps of Engineers
Raleigh Field Office

FROM: Travis W. Wilson, Highway Project Coordinator
Habitat Conservation Program

DATE: September 16, 2003

SUBJECT: U.S. Army Corps of Engineers Public Notice for Action ID No. 200321137, review of application for North Carolina Department of Transportation (NCDOT) to discharge dredge or fill material into waters and wetlands to construct Sections AB and AC of the Greensboro Western Urban Loop in Guilford County, North Carolina. TIP No. U-2524AB and AC.

Staff biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided by the U.S. Army Corps of Engineers. Our comments are provided in accordance with certain provisions of the Clean Water Act of 1977 (33 U.S.C. 466 et seq.) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

NCDOT proposes to impact 4.14 acres of jurisdictional wetlands 11,460 linear feet of jurisdictional streams, and 8.62 acres of ponds to construct sections AB and AC of the Greensboro Western Urban Loop, with a new interchange at Wendover Avenue and expanded interchanges at I-85 and I-40.

NCDOT has proposed the use of two wetland mitigation sites (Sandy Creek and Blue), and three stream mitigation sites (Woodlyn Way, Tick Creek, and Unnamed Tributary to Bear Creek) to mitigate for a portion of the stream and wetland impacts. NCDOT has mitigated for the remainder of stream and wetland impacts by payment to the North Carolina Wetland Restoration Program. Two stream relocations are associated with this project, Long Branch south of I-40 and an unnamed tributary to Reddick's Creek. NCDOT has committed to using natural stream designs and wooded buffers for these relocations

We feel that NCDOT has minimized impacts to wetlands and streams to the maximum extent practicable. The mitigation proposed for the unavoidable impacts appears to be sufficient. We do not object to the issuance of the '404' permit for this project provided the following conditions are part of the permit:

Mailing Address: Division of Inland Fisheries • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 733-3633 ext. 281 • Fax: (919) 715-7643

1. Riprap placed for bank stabilization should be limited to the streambank below the high water mark, and vegetation should be used for stabilization above the high water elevation.

2. Culverts and pipes must be designed to allow for aquatic life and fish passage. Culverts 48" or larger should be buried approximately 1' into the streambed. Culverts less than 48 inches in diameter should be buried to a depth equal to or greater than 20% their size to allow for aquatic life passage. These measurements must be based on natural thalweg depths. If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). This may be accomplished by utilizing sills on the upstream end to restrict or divert flow to the base flow barrel(s). Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. Install alternating or notched baffles in a manner that mimics existing stream pattern. This should enhance aquatic life passage by depositing sediments in the barrel, maintaining channel depth and flow regimes, and providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

3. The dimension, pattern, and profile of the stream above and below the base flow barrel(s) should not be modified by widening the stream channel or reducing the depth of the stream.

4. Stormwater should be routed to buffer areas and not discharge directly to the streams.

5. Heavy equipment should be operated from the bank rather than in the stream channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the streams.

6. If concrete is used during construction, adequate precautions must be taken to prevent direct contact between wet (uncured) concrete and stream water due to the potential for elevated pH that can cause a fish kill. Water that has contacted uncured concrete should not be discharged to surface waters.

7. Discharging hydroseeding mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is strictly prohibited.

Thank you for the opportunity to comment on this permit application. If you have any questions or we can be of further assistance please call me at (919) 528-9886.

cc: Gary Jordan, U.S. Fish and Wildlife Service, Raleigh
John Hennessy, DWQ, Raleigh

APPENDIX D - DEBIT LEDGER

Mitigation Project Name	**UT to Bear Creek (Phillips)**
EEP IMS ID	**92719**
River Basin	**CAPE FEAR**
Cataloging Unit	**03030003**

Applied Credit Ratios:			1:1	1.5:1	2.5:1	5:1	1:1	3:1	2:1	5:1	1:1	3:1	2:1	5:1	1:1	3:1	2:1	5:1						
			Stream Restoration	Stream Enhancement I	Stream Enhancement II	Stream Preservation	Riparian Restoration	Riparian Creation	Riparian Enhancement	Riparian Preservation	Nonriparian Restoration	Nonriparian Creation	Nonriparian Enhancement	Nonriparian Preservation	Coastal Marsh Restoration	Coastal Marsh Creation	Coastal Marsh Enhancement	Coastal Marsh Preservation	Stream Buffer Restoration (sf)	Stream Buffer Enhancement (sf)	Buffer Nutrient Offset Only (sf)	Total Stream Buffer (acres)	NO Nitrogen	NO Phosphorus
Beginning Balance (feet and acres)			**2,399.00**		**940.00**																			
Beginning Balance (mitigation credits)			**2,399.00**		**376.00**																			
NCDOT Pre-EEP Debits (feet and acres):		NCDOT TIP U-2524B - Greensboro Western Loop	1,806.00																					
EEP Debits (feet and acres):																								
DWQ Permit No	USACE Action IDs	Impact Project Name																						
2006-0331	2004-00340	NCDOT TIP R-0609IA / IB / R-2606 - US 311 Bypass (Future I-73/74)	593.00		882.50																			
Remaining Balance (feet and acres)			**0.00**		**57.50**																			
Remaining Balance (mitigation credits)			**0.00**		**23.00**																			

Information from EEP Debit Ledger dated 3/12/2014